Grid Operations and Management - Target 39

Contract #: 500-00-023 **Project #:** 17
Contractor: Electric Power Research Institute (EPRI)
Subcontractors: ABB Power T&D Co., Inc.: Best Systems, Inc. : Bonneville Power Administration : Decision Systems International : Hoffman Publications, Inc. : Incremental Systems : Iowa State University : Quality Training Systems : Xtensible Solutions, Inc.
Project Amount: $201,923
Match Amount: $5,156,709
Contractor Project Manager: Stephen Lee (650) 855-2486
Commission Contract Manager: Don Kondoleon (916) 654-3918
Status: Completed

Project Description:
The purpose of this project is to support EPRI's collaborative program in Grid Operations and Management, which is developing new tools and information that could be used to more efficiently and reliably operate the electricity power grid in California and the western region. EPRI products enable power system operators to cost-effectively upgrade systems, merge databases from different sources, exchange information in real time, and better manage systems during and following emergencies. To ensure the grid is capable of supporting the competitive market, EPRI software also offers capabilities for more accurately estimating and monitoring power system transactions. In addition, as the number and scale of transactions on the California grid increase, and as system security is challenged, EPRI provides new information and approaches for ensuring the reliability of the system.

This project supports the PIER Program objectives of:

- Improving the reliability/quality of California's electricity through innovative technologies, which help to balance the competing needs of maximizing the use of the grid while maintaining the security of the system.
- Improving the energy cost/value of California's electricity by merging new tools for grid functionality with information for operating in the new competitive marketplace. EPRI technology development programs will help to increase transmission capacity across constrained interfaces, thus reducing grid-operating costs, while enhancing system security.

Proposed Outcomes:

1. Provide software and information to reduce the costs and improve the efficiency of control center operation.
2. Provide software, methods, and information to enhance the transaction without impact on security.
3. Provide new methods and information to improve the security of the system and avoid management capabilities of transmission system operations, and to allow increased transactions system failures.

Actual Outcomes:

1. Reduce the Costs and Improve the Efficiency of Control Center Operations.
   - Three sets of tests were conducted that demonstrated a common language for information sharing among utility applications. In the tests software vendors exchanged versions of the Common Information Model (CIM) translated into the industry standard eXtensible Markup Language (XML), which permits the exchange of power system models in a format that any Energy Management System can understand using Internet or Microsoft technology.
   - A proposal was developed for a CIM standard, which would permit assembling diverse sources of enterprise data into a common database.
   - Two reports were produced on changes necessary to the existing standard for the real-time standard for data exchange.
   - Version 2.0 of EPRI's GOP Graphics System was developed and tested. The software, which provides a standard Graphical User Interface (GUI) for any EPRI gird operations software, was upgraded to allow remote access to applications.
   - Two products were developed to educate operators in emergency system management and restoration: the Tutorial for System Restoration and Version 2.0 of the Operator Training Simulator (OTS).
   - *Instructor Guidelines for Use of an Operator Training Simulator* was published.
   - A tri-annual newsletter was published on new software programs and methods for improved transmission grid operation.
2. Enhance Transaction Management.
   - Two reports were published on design specifications for a Topology Estimator and a beta version of Topology Estimator software was developed. This product will enable accurate estimate of the real-time network topology status, which is crucial for correct scheduling of generations and transactions.
   - EPRI participated in industry collaborative efforts to develop electronic scheduling capabilities, including Version 1.4 of the transaction management software Open Access Same-time Information System (OASIS) software.
3. Improve System Security.
   - A report was published that summarizes the 15 major accomplishments of EPRI's Security Mapping and Reliability Index Evaluation (SMRIE) project, which provides system operators with the capacity to monitor security levels quickly and accurately.
   - A report was published that describes on-line capabilities for detecting high-risk, or N-k, contingencies that result in unscheduled outages of multiple components within bulk high-voltage electric transmission systems.
   - A report was published that provides a systematic procedure for determining the effects on an entire power network of hidden failures in protection systems.

Project Status:

The project has been completed.